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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,040	03/26/2004	Donald A. Ice	15436.446.1	8454

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EXAMINER	
BEVERIDGE, RACHEL E	
ART UNIT	**PAPER NUMBER**
1725	

DATE MAILED: 10/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/810,040	ICE, DONALD A.	
	Examiner	Art Unit	
	Rachel E. Beveridge	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, and 6-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Ames et al. (US 2003/0085054 A1).

With respect to claim 1, Ames discloses a method of manufacturing an optical transceiver module (p. 2, [0010]), connecting a plurality of electrical contacts of a lead frame connector to corresponding leads of an optical sub-assembly to obtain a combined structure that includes the lead frame connector and the optical sub-assembly (p. 2, [0016]-[0017]); and Ames discloses attaching the optical sub-assembly to a printed circuit board using the lead frame connector such that the lead frame connector electrically connects the optical sub-assembly to the printed circuit board (p. 2, [0010] and [0018]). Ames also discloses the lead frame connector provides mechanical support for the optical sub-assembly; See figures 2 and 8-10, which show that there is no additional support for the optical assembly other than the flex cable, and see the support (66) in figure 9 (p. 3, [0023] and [0027]).

With regard to claim 2, Ames discloses passing each of the leads of the optical sub-assembly through a hole in the corresponding electrical contact, and soldering the leads to the corresponding electrical contacts (p. 2, [0016]).

Regarding claim 6, Ames discloses the optical sub-assembly is a transmitter optical sub-assembly (p. 1-2, [0009]-[0010]).

With respect to claim 7, Ames discloses the optical subassembly as a receiver optical sub-assembly (p. 1-2, [0009]-[0010]).

With respect to claim 8, Ames discloses connecting the plurality of electrical contacts to corresponding leads includes self-alignment of the lead frame connector with respect to the optical sub-assembly as the corresponding leads pass through holes in the electrical contacts (p. 2, [0016], lines 8-14).

Regarding claim 9, Ames discloses a method of manufacturing an optical transceiver module (p. 2, [0010]), obtaining a lead frame connector (p. 2, [0012]) that includes an electrically insulating casing (p. 2, [0013]), a plurality of conductors that are electrically isolated one from another by the electrically insulating casing (p. 2, [0013]); and the plurality of conductors forming a plurality of electrical contacts that correspond to leads of the optical sub-assembly (p. 2, [0016], lines 1-3), and a plurality of leads that correspond to conductive structure on the printed circuit board (p. 2, [0018]). Ames also discloses connecting the plurality of electrical contacts of the lead frame connector to the corresponding leads of an optical sub-assembly to obtain a combined structure that includes the lead frame connector and the optical sub-assembly (p. 2, [0016]-[0017]), and attaching the optical sub-assembly to a printed circuit board using the lead frame

connector such that the lead frame connector electrically connects the optical sub-assembly to the printed circuit board (p. 2, [0010] and [0018]). Ames also discloses the lead frame connector provides mechanical support for the optical sub-assembly; See figures 2 and 8-10, which show that there is no additional support for the optical assembly other than the flex cable, and see the support (66) in figure 9 (p. 3, [0023] and [0027]).

With regard to claim 10, Ames discloses attaching the optical assembly to the printed circuit board using the lead frame connector comprising a plurality of leads of the lead frame connector to corresponding conductive structures on the printed circuit board of the optical transceiver module (p. 1-2, [0009] and p. 2, [0013]-[0014]).

Regarding claim 11, Ames discloses bending the plurality of electrical contacts at discrete segments of the electrical contacts (p. 2, [0016]-[0020]).

With respect to claim 12, Ames discloses the electrical contact are bent at segments thereof prior to connecting the plurality of electrical contacts of the lead frame connector to corresponding leads of the optical sub-assembly (p. 2, [0019]-[0020], noting that the contacts are bent in order to fit the configuration desired for connection).

With regard to claim 13, Ames discloses the electrical contacts are bent at segments thereof prior to attaching the optical sub-assembly to the printed circuit board using the lead frame connector (p. 2, [0018]-[0020]).

Regarding claim 14, Ames discloses two of the segments of the bent electrical contacts are encased within a plastic (polyamide, a thermoplastic material) casing (p. 2, [0013] and see figures 1, 2, and 8-10 reference number 10).

With respect to claim 15, Ames discloses a first end of each of the electrical contacts is encased in a plastic casing and a second [end] (noting that the examiner assumed the applicant meant to claim a second end of the contacts) of each of the electrical contacts is not encased and capable of being soldered to the printed circuit board (p. 2, [0017]-[0018]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al. (US 5,295,214) in view of Ames et al. (US 2003/0085054 A1).

Card discloses a "process for manufacturing the improved soldered joint between an optical sub-assembly and a flexible ribbon cable; and more generally between the leads of a component and an electrical interconnect structure," (Card et al., col. 3, lines 54-58) as seen in figure 1(100). Card also discloses there is a connection between the exposed terminals of the conductors on the optical sub-assembly and the electrical circuit (col. 4, lines 64-68). Furthermore, Card discloses mass soldering of any flexible or rigid circuit board (abstract) and states, "the soldering bridge is made an integral part of the land so that the soldering bridge contributes to the strength of the connection between the land and the solder joint" (col. 6, lines 31-34) [claim 1]. Card discloses that

the leads in figure 1(104) are soldered within the holes in figure 1(106) (col. 4, lines 55-57 and col. 9, lines 63-69) [claim 2]. Card's disclosure of figure 1 and the positioning of "an electrical interconnection member within said housing and adjacent said first and second optical sub-assembly on the side of the sub-assemblies from which the leads extend, for electrical interconnection between elements of said optical module" (col. 10, lines 31-36) [claim 3]. Card discloses the method in which the optical sub-assembly and the ribbon cable are positioned, and lists reflow soldering as a process to attain this configuration (col. 8, lines 14-21) [claim 4]. Card also disclosed "typically, one optical sub-assembly is a light transmitter for converting an electrical signal into an optical signal and the other is a light receiver for converting the optical signal into an electrical signal" (col. 1, lines 48-53). Column 5, lines 24-29 refers to a transmitter optical sub-assembly and column 4, lines 51-57 refer to a receiver optical sub-assembly [claims 6 and 7]. Card's discloses leads that are "integrally connected" to conductors that extend into a dielectric layer of the flexible cables (col. 4, lines 57-60). Card teaches a dielectric layer with which the leads are connected to and conductors extend from (col. 4, lines 57-60), as seen in figure 1. The general definition of a dielectric material is one that is non-conducting and is therefore considered insulating [claim 8]. Card discloses a "process for manufacturing the improved soldered joint between an optical sub-assembly and a flexible ribbon cable; and more generally between the leads of a component and an electrical interconnect structure," (col. 3, lines 54-58) as seen in figure 1(100). Card also discloses electrical contacts corresponding to the leads of the optical sub-assembly and conductors connected to a circuit (col. 3, lines 54-58 and col.

4, lines 64-68). Furthermore, Card discloses mass soldering of any flexible or rigid circuit board (abstract) and states, "the soldering bridge is made an integral part of the land so that the soldering bridge contributes to the strength of the connection between the land and the solder joint" (col. 6, lines 31-34) [claims 9 and 10]. Card also discloses bending the plurality of electrical contacts at discrete segments of the electrical contacts (col. 4, lines 64-69) [claim 11], two of the segments of the bent electrical contacts are encased with a plastic casing (polyamide, a thermoplastic material) (col. 7, lines 64-68 and figures 1-2(10)) [claim 12], and a first end of each of the electrical contacts is encased in a plastic casing and a second (end) of each of the each of the electrical contacts is not encased and capable of being soldered to the printed circuit board (col. 4, lines 55-68 and col. 7, lines 64-68) [claim 15]. However, Card lacks suggestion that the lead frame connector (flexible cable) provides mechanical support for the optical sub-assembly. Ames discloses a lead frame connector provides mechanical support for the optical sub-assembly; See figures 2 and 8-10, which show that there is no additional support for the optical assembly other than the flex cable, and see the support (66) in figure 9 (Ames et al., p. 3, [0023] and [0027]) [claims 1 and 9]. Ames also discloses bending the plurality of electrical contacts at discrete segments of the electrical contacts (p. 2, [0016]-[0020]) [claim 12], and the electrical contacts are bent at segments thereof prior to attaching the optical sub-assembly to the printed circuit board using the lead frame connector (p. 2, [0018]-[0020]) [claim 13]. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Card et al. to include the lead frame mechanical support of Ames et al. in order to prevent

stress in the flex cable, and in the respective electrical connections between the leads and the flex cable (Ames et al., p. 3, [0023], lines 12-14).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ames et al. (US 2003/0085054 A1) as applied to claim 10 above, and further in view of Card et al. (US 5,295,214).

Ames lacks specific disclosure of reflow soldering the leads to the conductive structures. However, Card discloses the method in which the optical sub-assembly and the ribbon cable are positioned, and lists reflow soldering as a process to attain this configuration (Card et al., col. 8, lines 14-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Ames et al. to include the reflow soldering method of Card et al. in order to connect the sub-assembly to the cable (Card et al., col. 8, lines 10-20) and form an improved solder joint (Card et al., col. 3, lines 35-46).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ames et al. (US 2003/0085054 A1) as applied to claim 10 above, and further in view of Liu et al. (US 2003/0026081).

Ames does not disclose the hot bar process as the method for connecting the leads of the conductive structure to the printed circuit board. Liu teaches that the "protruding contact leads are suitable for hot bar reflow, which is where a heated bar is used to melt the contact leads such that they bond with an external surface" (Liu, p. 3,

col. 2, [0028], lines 10-13), as seen in figure 1 of Liu's application. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention Ames et al. to utilize a hot bar process in order to provide an efficient method for connecting the leads of the conductive structure to a printed circuit board (see Liu, p. 3, [0028], lines 10-13).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al. (US 5,295,214) and Ames et al. (US 2003/0085054 A1) as applied to claim 1 above, and further in view of Liu et al. (US 2003/0026081).

The combined invention of Card and Ames does not disclose the hot bar process as the method for connecting the leads of the conductive structure to the printed circuit board. Liu teaches that the "protruding contact leads are suitable for hot bar reflow, which is where a heated bar is used to melt the contact leads such that they bond with an external surface" (Liu, p. 3, col. 2, [0028], lines 10-13), as seen in figure 1 of Liu's application. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Card et al. and Ames et al. to utilize a hot bar process in order to provide an efficient method for connecting the leads of the conductive structure to a printed circuit board (see Liu, p. 3, [0028], lines 10-13).

Response to Arguments

Applicant's arguments, see page 7, filed October 9, 2006, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Card et al. (US 5,295,214) in view of Ames et al. (US 2003/0085054 A1).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is 571-272-5169. The examiner can normally be reached on Monday through Friday, 9 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

reb
October 20, 2006

JONATHAN JOHNSON
PRIMARY EXAMINER